

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



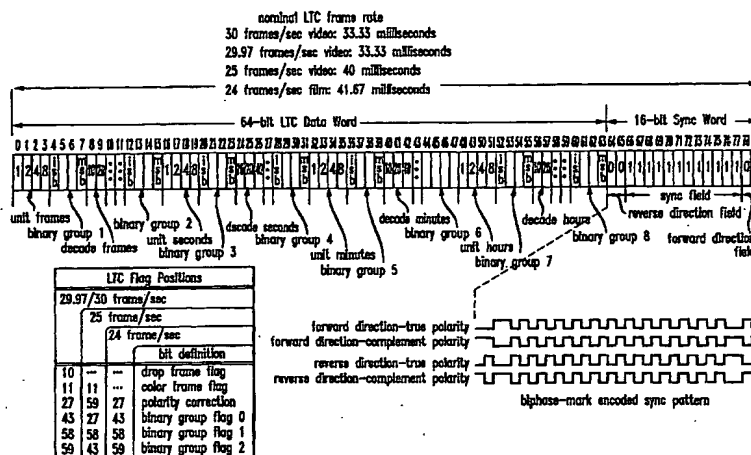
(43) International Publication Date
25 November 2004 (25.11.2004)

PCT

(10) International Publication Number
WO 2004/102219 A2

- (51) International Patent Classification⁷: **G01S**
- (21) International Application Number:
PCT/US2004/002143
- (22) International Filing Date: 26 January 2004 (26.01.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/469,437 9 May 2003 (09.05.2003) US
- (71) Applicant (for all designated States except US): **GRASS VALLEY (U.S.) INC.** [US/US]; 400 Providence Mine Road, Nevada City, CA 95959 (US).
- (72) Inventor; and
(75) Inventor/Applicant (for US only): **CIARDI, John, Joseph** [US/US]; 203 SW Santana Place, Portland, OR 97225 (US).
- (74) Agents: **TRIPOLI, Joseph, S.** et al.; Two Independence Way, Suite #200, Princeton, NJ 08540 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:
— without international search report and to be republished upon receipt of that report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **LINEAR TIME CODE RECEIVER**



(57) Abstract: An Linear Time Code (LTC) receiver (10) for receiving and decoding a LTC frame of the type used in connection with film and television and accompanying audio includes a first counter (12) that measures the number of reference clock periods within the duration of a bi-phase mark signal interval to yield a timing reference for extracting the payload from the LTC frame. A second counter (16) detects a sync field within the LTC frame to establish the LTC frame direction. A third counter (18) serves to count the number of symbols in the LTC frame. A state machine (12) responsive to the counts of the first, second and third counters (14, 16, 18), serves to (a) detect a valid synchronization sequence within an incoming LTC frame; (b) determine the LTC frame direction, (c) decode (extract) payload information from the LTC frame; and (d) transfer the payload information in an order determined by the LTC frame direction.